



2. Related Art

a A software <sup>package</sup> named Flashpoint provided by Knowledge Ware, Inc. is utilized to create screens for customer service representatives. PRISM software provided by Marcam is used to  
5 operate IBM AS/400 mini computers to support terminals using Flashpoint software. SMS software, supplied by ITLS of Canada, resides on the AS/400 platform to support the logistics function and TRACS software supplied by Westeley Development Corp., supports <sup>PCs</sup> PC's driven by the TRACS software.  
a Rhumba/400 Software is supplied by Wall Data, as well as PC Support by IBM to enable communications between an AS/400 platform and PC terminals. Furthermore, Software 2K provided  
a by Software 2000 of Boston, Massachusetts <sup>supports</sup> ~~to support~~ financial functions. Marcam has issued U.S. Patent No. 4,864,507  
a 15 pertaining to <sup>a</sup> method and apparatus for process manufacture control. The aforementioned vendor software and patent are hereby incorporated by reference.

20 None of the foregoing software is integrated to provide an efficient order management system. In the past, these software packages operated vertically. This prior architecture does not provide the necessary system integration for efficient real time data management.

SUMMARY OF THE INVENTION

The present invention has the ability to efficiently receive customer orders, process them, create appropriate financial records and coordinate this information with the inventory and manufacturing functions to prepare and load consolidated shipments for transportation to a customer. This is accomplished by touching each sub-system's data base on a real time basis by horizontal integration of each system to create a harmonious flow of data between systems. <sup>This</sup> The unique concept allows for continual updating of the system over time.

Most importantly, a deal with a customer is settled before the order is taken by using the horizontal data flow between systems to verify availability to meet the order, integrate customer data and price the deal while speaking to the customer.

It is an object of this invention to efficiently receive and process customer orders.

It is another objective of this invention to minimize costs of a food processing and supply business.

It is yet another object of this invention to create a system tailored to customer profiles for the delivery of products.

It is still another object of the invention to efficiently manage inventory.

It is yet another object of the invention to efficiently assemble and deliver loads of products to customers.

It is further an object of this invention to efficiently purchase and account for materials.

5 It is still another object of this invention to create a financial system to support each of the above objectives.

It is an object of this invention to create and integrate a system incorporating the above features at minimal cost.

10 It is still another object of this invention to provide business control features to manage such a system.

#### BRIEF DESCRIPTION OF THE DRAWINGS

15 The invention is better understood by reading the following Detailed Description of the Preferred Embodiments with reference to the accompanying drawing figures, in which like reference numerals refer to like elements throughout, and in which:

Fig. 1 illustrates an overview of the order management system.

20 Fig. 1a illustrates the application software architecture.

Fig. 1b illustrates the order management update and controls.

25 Fig. 2 illustrates the order fulfillment and architecture.

Fig. 3 illustrates an order fulfillment customer representative screen.

5 Fig. 4 illustrates an order fulfillment customer/master file maintenance selection screen for use by a customer service representative.

Fig. 5 illustrates an order fulfillment screen for use by a customer service representative to maintain customer master controls.

10 Fig. 6 illustrates a screen for order entry by a customer service representative.

Fig. 7 illustrates the order acceptance system.

Fig. 8 illustrates the system management software/TRACS architecture.

15 Fig. 9 illustrates, in diagrammatic form, the delivery process for managing and executing the activities associated with inbound and outbound movement of goods.

Fig. 10 illustrates diagrammatically the traffic management network of all incoming and outgoing deliveries.

Fig. 11 illustrates the logistics system interfaces.

20 Fig. 12 illustrates the delivery subprocess for order delivery planning.

Fig. 13 illustrates the delivery process flow charts for order consolidation.

25 Fig. 14 illustrates the delivery subprocess for carrier selection.

Fig. 15 illustrates a delivery subprocess for load release.

Fig. 16 illustrates a delivery subprocess for freight claim management.

5 Fig. 17 illustrates a delivery subprocess for freight claim management.

Fig. 18 illustrates a delivery subprocess for freight claim management.

10 Fig. 19 illustrates a delivery subprocess for freight payment/reconciliation.

Fig. 20 illustrates a delivery subprocess for proof of delivery.

Fig. 21 illustrates a product flow from receipt to the staging area for storage and ultimately shipment.

15 Fig. 22 illustrates a flow chart of a transaction (TR).

Fig. 23 illustrates a system for hand-held warehouse reading devices interconnected to a dedicated network through a radio base for inputting and receiving warehouse data.

20 Fig. 24 illustrates an inventory management normal cycle overview.

Fig. 25 illustrates a production receiving schematic.

Fig. 26 illustrates a vendor receiving schematic.

Fig. 27 illustrates a put-away schematic for identifying and placing goods received.

Fig. 28 illustrates a schematic for workload planning for receiving orders and placing shipments.

Fig. 29 illustrates an order-pick schematic for selecting orders and delivering to destinations.

5 Fig. 30 illustrates a batch-pick schematic for selecting orders and delivering pallets of such orders to warehouse for put away.

10 Fig. 31 illustrates an order load and closeout schematic showing the process for documenting orders and their ultimate filing into the system of this invention.

Fig. 32 illustrates a cycle count diagram for determining product scheduled for processing and movement to inventory as well as updating inventory.

15 Fig. 33 illustrates year-end physical schematic to provide a year-end inventory count.

Fig. 34 illustrates a consolidation schematic showing the process of moving goods to new locations for efficient storage and processing.

20 Fig. 35 illustrates a return schematic demonstrating the receipt of goods that are returned to either inventory or to quarantine.

Fig. 36 illustrates an outside storage schematic showing the movement of goods from inventory, to storage and ultimately receiving.

Fig. 37 illustrates the standardized process and end solution for creating an electronic catalog and system to support it.

5 Fig. 38 illustrates the relationship of an electronic catalog to the various components using it.

Fig. 39 illustrates the information stored in an electronic catalog.

Fig. 40 illustrates how the electronic catalog accesses information in various data bases.

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SECRET



DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In describing preferred embodiments of the present invention illustrated in the drawings, specific terminology is employed for the sake of clarity. However, the invention is not intended to be limited to the specific terminology so selected, and it is to be understood that each specific element includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

I. ORDER MANAGEMENT

Referring to Fig. 1, it shows an overall schematic of the order processing data flow, based on an IBM AS/400 platform. The figure is self-explanatory and will be amplified in the following description of this invention by reference to the specific figures that go into the necessary detail.

Referring to fig. 1a, there is shown the software functions resident in the networked AS/400s and interconnected PCs. The PRISM software resides on AS/400 1.a., Software 2000 resides on AS/400 1.b., and Shipment Management System (SMS) software resides on AS/400 1.c. AS/400's 1.a., 1.b., and 1.c. are networked and support PCs 1.d. <sup>each of which</sup> that has resident enabler software Flashpoint shown as 1.e. Also, residing in these PCs are solution software 1.f. for creating DEALS, purchasing interface, pricing and profitability (hereinafter described).

The SMS software in AS/400 1.c. supports <sup>PCs</sup> PC's 1.g. having

Flashpoint software 1.e. and TRACS load builder software 1.h., hereinafter described. The implementation of both solution softwares (1.f. and 1.h.) are unique to this invention.

5 Generally, the GUI (graphic user interface) consolidates the various fields by pulling data from numerous screens into one screen used by a customer service representative. When a specific field is entered, the interface updates the supporting multiple screens thereby saving time while interacting with a customer. The resulting screen is user friendly and responds to queries in real time.

10 PRISM software on the AS/400 platform interfaces with Flashpoint software on the PC platforms to allow the creation of the above described user friendly screens, and to interact with other modules of this invention. The enabler software between the PRISM customer order management software and the Flashpoint software is the Rhumba 400 and IBM PC support. This interface also talks to Software 2000 that maintains accounts receivable (A/R) files. It also allows for keeping separate data stored in synchronization without having the data keyed in.

15 Fig. 1b further describes the relationship of input devices (2 and 4) to the system which captures sales representative and customer activities including financial data. Shown here is the use of Gelco checks (6) and input devices (2 and 4) to input and manage DEALS (8). Gelco (6) is

an existing vendor that allows checks to be written to customers for a variety of reasons. The Gelco checks (6) and information from input devices (2 and 4) then are fed into the DEAL system (8), to properly reflect discretionary spending.

5 The information from the DEAL system (8) is transmitted to the order management system and updates the control function (10) where it creates activity reporting (12) to give input for sales representative reports, customer profitability reports, pricing reports and deals and discretionary reports. The  
10 information also flows from order management update control to pricing function (14) where the details of pricing are worked out using product costs, freight increments, profit margin, market adjustment and other charges to create correct pricing. Likewise information flows from order management updates and  
15 controls to financial systems (16) where appropriate financial records are created. These include invoicing, credit memo, accounts payable checks, price lists and discount lists, among many others.

Referring to fig. 2 the order fulfillment architecture  
20 has multiple inputs from computer integrated manufacturing systems at various locations as well as from warehousing data base (24). Information on the activities at these various sites are fed into the central customer order management (COM) (26) function and at the same time, information is fed to a  
25 software package supplied by a vendor known as Software 2000

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(28). Accounts receivable and the general ledger functions are created using Software 2000 (28). The foregoing functions are performed on an AS/400 platform. Data from the customer order management system is transmitted to Flashpoint software (30), that resides on personal computers or like equipment such as work stations. This software is used as a basis to create business scripts (32, 34, 36 and 38) that are displayed on each personal computer to aid customer service representatives in taking and creating orders.

Fig. 3 demonstrates one of the screens created for the order fulfillment function used by a customer service representative. Shown in Fig. 3 are the various files that have been created based upon the Flashpoint software. Unique to this system is the windowing of such files in one location for a customer service representative so that he or she does not have to page back and forth through the software while engaged in a discussion with a customer to create an order. As a result, orders are taken and fulfilled promptly in a real time mode because the file folder serves as a main menu which can be navigated using the mouse to select a business event unlike in the past where there was much delay in the process.

Fig. 4 shows another order fulfillment screen used by customer service representatives. It is entitled Customer Master File Maintenance Selection and by use of a mouse the customer service representative can quickly navigate through

the basic data on a customer and if necessary update it based upon the interview. This submenu has been customized to a series of radio (40, 42) and push (44) buttons in order that the majority of the navigation can be accomplished by single mouse clicks.

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Fig. 5 shows a further screen entitled Maintain Customer Master Control Screen used by customer service representatives. This screen has the basic data for each customer and once again can be navigated promptly to update it if necessary. If the information is correct it is the basis for creating the customer records used throughout this system. This screen is populated by data entered on previous screens in order that the screen user does not have to re-key, thus eliminating a potential for unsynchronized master files. Also, the "Bill To" and "Ship To" screen sequence is customized for this presentation. "Ship To" navigates forward through related screens then automatically navigates in reverse, and activates Software 2000 customer maintenance files saving the operator the navigation.

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Fig. 6 is entitled Order Form and it has the basic information blocks to be completed in creating an order by a customer service representative. This screen has the series of buttons added to easily allow access to additional screens. The "Resource Description" (50) and "Sm" (52) fields were pulled in from other screens.

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Shown in Fig. 4, 5 and 6 are radio buttons as well as well as normal push buttons to indicate functions that may be selected by the operator to allow real time navigation through the files supporting these screens. The feature of updating files forward and backwards results in error free master files.

## II. FINANCIAL

The Exception Resolution process design (103) involves putting in procedures and policies to ensure customer service levels. This begins with the order acceptance process all the way through the collection and application of cash. For any problems that arise, ~~in~~ that process will have procedures and policies to handle and resolve them.

Referring to fig. 7, Order Acceptance (100) is the beginning of the entire process. Data can enter the system via two ways, (1) manual entry from the customer service representative and the tool they use is a Knowledge Ware based application that interacts with the AS/400, PRISM system for manually taking orders or (2) by EDI transmissions. At order acceptance the system goes through a variety of validations shown on the left-hand side of this diagram as a process called Rule Validation (102). Validated order and customer attributes include, but are not limited to, the order lead time required from the customer, their delivery schedules,

whether delivery schedules can be met, their credit, available inventories and production times for their products and like rules. This feedback is conveyed to the customer while on the telephone. With the EDI scenario exception reports will be  
5 created and conveyed to the customer.

Logistics (104) primary objective is to reduce the outbound and also the inbound freight costs of the organization. This is accomplished in a couple of ways (1) by using software to consolidate the less than truckload  
10 shipments to different plants to have better utilization of the trucking operation. It also houses a low cost core carrier list to be utilized to expedite shipping processes and to monitor the performances of carriers.

Pricing (105) is in software residing on a LAN file  
15 server. It is geared towards looking at customers, markets and products. In addition, it brings in other business data like product cost, profitability targets, where customer ship-to's are located, freight delivering cost to develop delivery pricing to customer and FOB pricing picking up shipper's dock. Included are market adjustments, overhead, et cetera, to be  
20 used to compile and work out a customer product pricing. (Also seen on fig. 14<sup>b</sup><sub>A</sub>(14)).

Warehousing (106) is designed to ensure inventory  
accuracy, <sup>to</sup> put away and <sup>retrieve</sup> ~~retrieval~~ of inventory in an expedient  
25 fashion, to validate the order to ensure what is loaded on the

truck, and to ensure all documentation prepared for the shipment is accomplished.

DEALS (8) includes discretionary spending, negotiating deals with customers by writing them an AP check to rebate for performance, initiating a credit memo to them on account, giving them a "Gelco check" for buying advertisements, or buying down their price for special promotional activities that customers may undertake. Also, the sales representatives will have the ability to put discount lists into the system via this DEAL system (8) to give them a special allowance. This information is fed into PRISM and shows an allowance off of their invoice when invoicing occurs. The sales representative can create a credit memo to issue invoice errors and apply the amount to a pre-set account.

This DEAL system (8) also houses the sales representatives' targets by product category and customer by which they will be measured. This also gathers the data to support customer profitability reporting.

Performance Reporting (112) is where all the data comes together. This is outside of the AS/400 environment, on a LAN file server, to gather data from the order acceptance, the invoicing, the pricing, the shipping and the DEALS (8) function, plus brokerage fees to brokerage companies that service accounts. From this data is generated all of the performance reportings such as sales representative



activities, customer profitability, analysis of movement trends and the like. There will be a customer score card created to rate the customer for profitability, volume and the like. This data is used for management decisions related to this customer.

Order Fulfillment (114) is used after order acceptance and it gets the product picked and packed at the warehouse, closes the order, and generates all necessary documents.

Credit Memo (116), G/L (General Ledger) (118), AP (Accounts Payable) System (120), Accounts Receivable System (122), how customer credit is established, and procedures (how they interact at order entry time is important), and are all traditional accounting functions.

### III. LOGISTICS

#### ORDER PLANNING

Referring to Figure 8 entitled SMS/TRACS Architecture, (SMS, also known as shipment management system) which is a vendor supplied software. The diagram shown in this figure lays out the relationship of the hardware in this system as well as the supporting software. It is understandable by one skilled in the art upon examining this figure and will only be touched upon lightly. The main frame has resident software for providing order management. This software communicates with the AS/400 (150) which is networked with other AS/400s to

create the basic information network. Residing on the AS/400 (150) platform is the SMS Software supplied by ITLS of Canada, and on the PCs the TRACS Software supplied by Westeley Development Corp. of Stamford, Connecticut. This combined software has the functions indicated on the drawing and also communicates with an accounting function supported by Software 2000 (28). The SMS/TRACS software residing in the AS/400 (150) further supports PCs (152) or work stations or the like with information generated by the AS/400 (150) resident software on rates, customer information and less than full truckload shipments. This software provides for consolidation of less than full loads, as well as creates shipment and load reports. It likewise creates information feeding back to the AS/400 (150) to create shipping instructions. The use of this hardware and software combination uniquely supports the logistics system for load building. The load builder function includes load tendering, load planning, load confirmation and load inquiry to build loads. This allows handling multiple orders to create a load.

Figure 9 is a diagram of the delivery process for managing and executing activities associated with inbound and outbound movement of goods. Shown in the diagram is the function of <sup>taking</sup> incoming orders (154) from customers as well as distribution center replenishment, information on returns and purchase of raw materials generated through POs. This

information flows to the order consolidation function (156) from which information goes to the function for carrier selection (158). The carrier selection function (158), as further described hereafter, goes through a series of decision making steps to select the correct carrier for the correct destination and load for that carrier and takes this information and sends it to the load release receipt function (160) where data is created to input to the carrier monitoring function (162) as well as <sup>the</sup> shipment tracking function (164). From the shipping tracking function (164) information flows to the freight claim management function (166) as well as the freight payment reconciliation function (168). There is feedback from the freight claim management function (166) to the carrier monitoring function (162) as the case may be. The carrier selection function (158), carrier monitoring function (162), shipment tracking function (164) and the freight payment function (166) all have EDI connections to customers to create data bases necessary to support these functions.

Figure 10 is a diagram of the traffic management network showing how goods are received and distributed using the system. It is a system that allows for multiple tracing of carriers available to deliver goods to customers.

Figure 11 is a diagram of the logistics system interface. Shown in this interface are the various software and communications that support the system. The Software 2000

(28) supports the accounts payable function as previously described. PRISM software (170) supports the order management function and Software 2000 (28) supports the accounts receivable function, all of which feed into logistics systems (104) where the various bits of data created are used for support. From the logistics system (104) outbound orders (172) are received as well as internal information on<sup>the</sup> production of goods. The logistics system (104) is connected through EDI (174) and fax (176) to carriers for tendering and accepting delivery.

Referring to Figure 12, Order Delivery Planning (300) is where orders are received from the order management system. The first action with the orders is to download them into the system, then sort them based on ship date, and also by priority such as a quick delivery. For example, there are orders for a particular shipping date, those orders would be sorted into full truckloads including those that are LTL (less than a truckload) and customer pickup (the carrier or customer picks the order up with their private fleet i.e., an XYZ truck or customer arranges their own carrier which means that XYZ arranges ABC carrier to come and pick it up). Referring to the schedule load appointment function in Box 306, if it is a customer pickup, then an appointment is scheduled to actually come to the dock and load the product. The warehouse keeps a list of appointments and times, (i.e., eight trucks can load

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in one hour, and therefore there are eight time slots for one hour increments) and records the trucks schedules. The dotted line is for the carrier to actually call in and confirm or set the appointment with the warehouse. The arrow coming down indicates that the truck will be loaded when the carrier arrives.

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If it is not a customer pickup, go to the Full Truckload decision in Box 308 which questions a full truckload or not. Full truckload means did the customer order an entire truckload with their product or is their order on two separate truckloads. For example, is there half an order of frozen and half an order of chilled orange juice? In the present system, these are two separate orders, and therefore do not create a full truckload even though in theory it would be a full truckload. If there is a full truckload you go to "carrier selection" which will be two or three processes down the decision tree. If you don't, the orders are passed onto order consolidation. Again, the process here is to determine which are full truckloads and which are LTL shipments. The LTL shipments would again go to the order consolidation function which is one of the keys to the entire process.

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#### ORDER CONSOLIDATION

Referring to Figure 13, Box 310 this is the same decision process that was made in the order delivery planning process

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of Figure 12, but instead, if a full truckload the arrow goes to the left and goes down to carrier selection. There is no need to go through consolidation because it is a full truckload. If it is not a full truckload, go to the order consolidation function of Box 312. This results in putting LTL shipments into a full truckload. The system goes through certain decisions to determine what is the optimal truckload. The next few boxes are decisions which are made by the software. The AS/400 is able to load build correctly on its resident logic. It is a matter of a logistic planner's judgment to override the internal logic. For the majority of the loads, the load decision is made in the PC based software package to perform the optimal consolidation. The decisions that the actual software goes through are based on a transportation algorithm, in software on the AS/400 Platform shown in Box 314. It looks at a delivery window which means when does that product need to be delivered? Most orders are sorted by shipment date. If an order is shipped on Tuesday, the query is when does it need to be delivered? The query is, how long does it take for a product to get to a certain area, in other words, from Dade City to California it could take two days, but from Dade City to Las Vegas it also might take two days. This data is used to decide, whether those two orders can go on the same truck, i.e., can it fit the delivery window based on the guaranteed delivery date for that customer? The

system looks at a window delivery and asks if the loads can be consolidated based on transit time, et cetera.

Further, the function shown in Box 316 asks if they can be consolidated if the delivery window is compatible and if the customer shipped to is the same?

The next decision is shown in Box 318 and asks if it is a truckload? Of course, if a full truckload is determined there is no need to proceed. This would be the optimal consolidation if a half a truckload of frozen and a half a truckload of chilled orange juice go to the same customer. Then you have <sup>a</sup> full truckload going to the same customer and delivered on the same day, for optimal consolidation. If the arrow to the left says there is a full truckload, the decision tree goes down immediately into carrier selection.

If the decision shown in Box 320 says there is not a full truckload but two orders are going to the same customer, it then looks at other orders going in the same destination area. There is basically one more check within the destination area. If not, it goes back into the rest of the orders for the next consolidation which is the arrow to the right.

If it is in the same destination area, then it goes to Box 322 the origin area locations 1 and 2. The system would try to put all orders for location 1 before putting location 2. If not in the same origin area the arrow goes to the right and it goes back into potential consolidation with other

orders. If yes, it is in the origin area, then the decision arrow going down indicates it might be consolidated.

5 The decision shown in Box 324, "form", means the form of the product, i.e. frozen, chilled or dry, because the way it is loaded in the truck makes a difference. Frozen goes in the nose of the truck, followed by chilled, and then dry. The reason for this is the location of the cooling unit. Therefore, these should be loaded exactly opposite of the way the truck is built. Stop 1 would be dry, stop 2 chilled, and  
10 stop 3 frozen to prevent unnecessary unloading. Consolidation is determined in this form.

The decision shown in Box 326 is the consolidation process. The preceding decisions result in the consideration input to Box 328 to consolidate loads by picking the furthest  
15 and latest point away and to build the truckload from that information.

The decision of Box 330 is to select the next closest, i.e. shipment to Los Angeles and San Francisco (next closest). It looks at the next closest load that fits the other  
20 requirements (form, destination, origin, et cetera).

The decision of Box 332 says does it fit the time and capacity? Capacity means "x" amount of weight and truckload (for juice it is about 44,000 lbs, meat 36,000 lbs). The difference being that the meat product is packed different on  
25 the pallet to only get about 20 pallets on a truck, and the



way the meat is stacked results in about 36,000 lbs, not fully cubed out most of the time. Juice products are case goods that are stacked accordingly and can obtain fully cubed out pallets of about 44,000 lbs. Therefore, two 25,000 lb juice orders cannot be sent on the same truck or the load will be 50,000 lbs and the truck would be <sup>overweight</sup> ~~over-weight~~ and not legal.

If the decision is yes, then go to Box 334 which <sup>takes the data</sup> ~~says is~~ that there <sup>is</sup> 44,000 lbs of juice or 36,000 lbs of meat. This data is compared to maximum truckload weight. If ~~it is maxed out,~~ then the order consolidation is finished. If not, then more orders need to be picked to get up to that truckload amount.

If yes, the consolidation is finished, then go to Box 336 and answer what is the cost of delivering these orders. The cost of full truckload rates is built into the system for carrier X.

The next decision Box is 338 which asks if that is acceptable. The logistics planner is going to use his judgment when he sees what the system calculates and the cost. If not acceptable, then it will go back to consolidation and possibly change the parameters. It might be done manually with the system actually calculating the difference in freight. If it is not acceptable, there is the option to do a manual load build.

If acceptable, go to Box 340 which <sup>queries if it is</sup> ~~says is it~~ a full truckload? This means that it may not be a full truckload and

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there may only be so many orders which can be consolidated or  
weighted out (44,000 lbs). <sup>i.e.,</sup> If there are not enough full  
truckloads from of all these orders, which does occasionally  
happen, some LTL carriers do their own load consolidation and  
5 pick up small orders from various customers and go to a dock  
and break bulk terminal to put loads together on the same  
truck. These carriers are more costly due to the personal  
consolidation and handling of the product. The ultimate goal  
is to build full truckloads to lower the freight costs rather  
10 than have someone else do it.

If not, go to LTL carrier assignment. The lowest cost  
LTL carrier should be tendered the load. If it is a full  
truckload go directly to carrier selection, which is  
assignment of a full truckload carrier. Either way, there is  
15 a carrier selection process.

#### CARRIER SELECTION PROCESS

Referring to Figure 14, beginning with the economic  
truckload decision shown in Box 342, meaning from a weight  
20 standpoint it may make sense to actually build it as a  
truckload even though its not fully weighted out such as a  
meat delivery.

The decision point in Box 344 is customer requested  
carrier. A customer may request a specific carrier. If yes,

it goes to Box 352 which says to notify a carrier that they have a load. This comes later in the decision process.

If not, the decision goes to Box 346 and asks if any of the in-house fleets want the load. If not, go to Box 348 carrier assignment. A database has been designed and <sup>set up</sup> ~~setup~~ which contains all of the carriers, service areas and rates. It looks at all the carriers and picks a carrier from the list which is decision Box 350.

Decision Box 350 <sup>determines from</sup> ~~says give me~~ a list of carriers that haul products to <sup>az</sup> ~~these~~ areas. The carrier list identifies the carriers and their rates to selected areas. The load is then tendered to the selected carrier with the lowest rate, but the lowest may not have the right equipment available and therefore the decision is made to offer to carrier B. Therefore, the decision is not only the lowest cost carriers with available equipment.

The decision Box 360 feeds into <sup>the decision process of Box 350 and</sup> ~~this and says here is a~~ inputs carrier monitoring process which helps <sup>determine</sup> ~~you decide~~ which carrier to use <sup>based on different factors and not on just the</sup> ~~not on just~~ cost factor alone. Even though carrier A may be the lowest cost carrier its service rate may be less than 100%, <sup>e.g. 90%, while</sup> ~~say 90%~~, and carrier B may be 99% and only cost \$10.00 more. Then the decision is <sup>made</sup> ~~to~~ use carrier B because of the service level considerations. If none of the carriers have equipment available to haul the load, then <sup>the decision goes</sup> ~~go~~ back to in-house carrier. Assuming that a carrier was not

a found, <sup>the process goes</sup> ~~go~~ to Box 346. At certain times of the year it <sup>has been</sup> ~~is~~ found difficult to assign carriers to products, necessitating the use of in-house fleets.

5 Decision Box 352 notifies the carrier. This may be done by telephone or EDI. If via EDI, the carrier may access their mailbox and say yes or no. There are certain transaction forms <sup>that are then generated</sup>. One is a load tender form <sup>990 that</sup> and the carrier would send back <sup>with</sup> ~~a 990~~ which is an acceptance or rejection of the load. If carrier's are on EDI it would be an efficient process. There

10 is also a load tender form which is not in any of these other process boxes which <sup>states</sup> ~~says this is~~ what the contents of the load are, for example, the customer, weight, product type, delivery date, et cetera. Rather than relay <sup>the information</sup> over the phone, a fax including the information is sent to the carrier via <sup>the</sup> load tender form ~~and~~ requesting the carrier's signature if the load is accepted. After acceptance, the executed form is returned via fax. The manual notification of <sup>the</sup> carrier process is <sup>by</sup> fax, phone or <sup>a</sup> combination thereof. EDI is <sup>however</sup> ~~the~~ preferred means.

20 Decision Box 354 is a less than truckload shipment. Certain orders are LTL shipments and need to go through a carrier selection process.

a Decision Box 356 <sup>queries if</sup> ~~says~~ ~~has that~~ the customer requested an LTL carrier? There are only a few carriers that haul LTL shipments. If it is not a customer requested carrier, then <sup>the process</sup> ~~go~~ goes to the regular carrier assignment decision in Box 348. The

decision is no different for an LTL shipment than for a full truckload regarding carrier assignment considerations. The service level of LTL is also considered. In other words, carrier A may be a truckload only going to that area and truckload B may be a LTL carrier going to that service area. If the LTLs go to California, the decision is to pick that carrier.

Decision Box <sup>356</sup> 352 <sup>first determines if there</sup> ~~says if it~~ is a customer requested carrier then <sup>goes</sup> through the carrier selection process of Box 352.

Decision Box 358 <sup>instructs that the carrier is</sup> ~~says you want the carrier~~ to confirm the appointment, meaning that they will pick up the product at <sup>the</sup> your warehouse. This process is done by the carrier calling the warehouse and confirming the appointment. If they do not confirm the appointment, then <sup>the load is canceled and the process follows</sup> ~~cancel the load and follow the~~ exact same selection process, and <sup>reassigns</sup> ~~reassigns~~ the carrier's load to another carrier.

<sup>As discussed above, decision</sup> Decision Box 360 feeds into the carrier selection process. The carrier monitoring process ~~is likewise involved.~~ It sets the standards a carrier must meet before it is selected. Criteria are established such as 98% on time delivery, <sup>or</sup> 1% claims, meaning damaged <sup>products</sup> product, short <sup>products</sup> products or overages that are related to the carrier. In other words, the load could be shipped short which <sup>may</sup> ~~would~~ not be the carrier's fault, but if the carrier has continual shortages, this needs

to be tracked. The carrier monitoring process also considers the number of times a carrier rejects a load. For example, if 10 loads were offered and only 8 were accepted, it could mean unavailable equipment. Another criteria is the time it takes to pick up the order at the warehouse, and if they are late. This is considered an exception to on time pick up. If the standard is 98% on time and they are 97% on time, this <sup>information</sup> needs to be captured. The carrier is required to furnish the actual delivery date. The result is a report or score card which gives them a rating. The selection process is used to weed out the carriers that do not provide the required service level. Based on the report card, the carriage may be rebid to other carriers.

#### LOAD RELEASE

Referring to Figure 15, decision Box 362 basically <sup>outputs</sup> says that the order was received from order management and has been through the carrier selection process, load consolidation, et cetera because for load release purposes the order that the loads are going to be put on the truck, which loads are going to be put together on the same truck, etc. is required.

Decision Box 364 is the order release portion. At that point there is a decision as to whether the order is going to be shipped. Logistics would actually confirm and send it to the warehouse to be shipped.

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Decision Box 366 <sup>instructs to</sup> ~~says~~ generate a pick ticket. A pick ticket is something that is used by the warehouse to determine the location that a product is stored. It shows the products to be put on the truck by SKU level. It states for example that 100 cases of Florida Gold and a 64 oz 12 (12 64 oz to a case) are needed. It may then pick 100 cases of Old South Premium chilled orange juice 8 oz bottles that are 84 to a case. It locates <sup>the</sup> product by SKU level and instructs placement on the truck by order. It may have multiple orders for one truckload. Box 374, going off <sup>the order release in decision BOX 364</sup> ~~to the left of order release,~~ is another pick ticket which is the same as decision Box 366.

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Decision Box 376 is where <sup>the truck is actually loaded</sup> ~~you actually load the truck.~~ Again, <sup>the truck must be loading taking</sup> ~~you need to load the truck and take~~ into consideration <sup>the</sup> commodity <sup>type(s) of the load</sup> ~~types.~~ Decision Box 376 determines how <sup>to</sup> ~~you~~ actually load the truck, frozen, chilled and dry;

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Decision Box 368 <sup>determines that</sup> ~~says~~ the load needs to be closed. At the time the load is closed, the SMS software in the warehouse produces a screen that says the <sup>load</sup> ~~product~~ that is going to the Supervalve in Omaha, Nebraska <sup>consists s</sup> ~~consisting~~ of 200 cases of Florida Gold and 300 cases of Old South at a particular weight. In order to change the count, a warehouse person must verify the count, in other words override the 200 cases of Florida Gold to 201. The weight is either manually or automatically calculated. At that time the Bill of Lading is generated, by the PRISM software system using an SKU number so

that a change in quantity would <sup>automatically change the data on the</sup> ~~automatically change~~ weight. A four digit alpha code designating the carrier is used to produce that information directly on the Bill of Lading, closing the load and generating the Bill of Lading.

5 Decision Box 370 means that information feeds into the invoices. It <sup>is fed into by Box 368 as well for indicating</sup> ~~feeds into Box 368 as well and says yes that~~ <sup>the</sup> product was shipped. As a result, an invoice is created.

Decision Boxes 370 and 372 are information <sup>outputs</sup> ~~which feeds~~ <sup>feed</sup> to the financial data base.

10 Returning to decision Box 380, a Bill of Lading is generated, which is a legal document that the carrier must retain on the truck at all times as he is hauling the product. This states the products that are on the truck; where the products are being delivered, and the carrier. It is a legal document required by the ICC for shipments on interstate highways. A Bill of Lading is generated by the system after the information in Box 368 is inputted to close out the load.

15 Decision Box 382 <sup>determines</sup> says that the driver signs the Bill of Lading. The driver basically signs that he received that product. <sup>For example, decision Box 382 indicates that the driver received</sup> ~~in other words, I received in my truck 200 cases of~~ <sup>in the</sup> Florida Gold orange juice. When <sup>the load reaches its destination</sup> ~~it gets to the other end and~~ the customer says <sup>they</sup> ~~I~~ only received 199 cases, the carrier <sup>can be</sup> ~~is~~ held accountable. <sup>The carrier basically signed to say that they</sup> ~~He's basically signing to say that yes, I~~ received <sup>and are responsible for</sup> 200 cases of product. <sup>The signing also makes the Bill of</sup> ~~it also makes it a fully~~ Lading executed <sup>document</sup> ~~documents~~ for legal purposes.



a Decision Box 382 <sup>indicates</sup> says that the Bill of Lading on file should have been executed by the driver to verify any information that may needed at a later date.

5 Decision Box 384 is a completed Bill of Lading after the driver signs it.

### FREIGHT CLAIM MANAGEMENT

a 10 Referring to Figure 16, decision Box 386 indicates a phone call from the carrier/customer. The carrier has to call while he's at the customer's dock, but <sup>the customer</sup> it could also be the <sup>one...</sup> customer that calls. At this point, <sup>the process goes</sup> go to freight claim management in decision Box 388 if there is a claim.

a 15 Decision Box 390 is when a phone call is received from the carrier or customer, a sequential incident number is assigned. It is called an incident number because at <sup>that</sup> this point there is no decision as to whether it is going to be a claim or not. It tracks all instances of overages, shortages, and damages (OS&D).

a 20 Decision Box 400 says to generate any credit/debit memo for any OS&D. If after going through the entire claim process and determining that there is an OS&D and <sup>the shipper is</sup> ~~its the shipper's~~ at <sup>is generated it is</sup> fault, then generate a debit and credit memo <sup>so that</sup> ~~its~~ outside of <sup>the normal</sup> this process. If there is an OS&D involved the customer will not pay for that. If <sup>the customer</sup> it ordered the 200 cases of Florida Gold orange juice and only <sup>received</sup> ~~got~~ 199, short 1 case,

it will only pay for 199. A debit/credit memo is generated to accounts receivable so that when that customer pays for that invoice its only going to pay you for 199. The customer's accounts receivable is then updated.

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Decision Box 410 <sup>indicates to notify an</sup> ~~says to notify~~ order management caseworker of reported shortages and damages. In other words, the carrier calls and reports the customer's shipment was short or damaged. Order management is <sup>then</sup> notified.

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Decision Box 412 <sup>indicates</sup> ~~says to~~ notify a caseworker to be proactive with customers to settle potential claims.

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Decision Box 414 <sup>indicates</sup> ~~says that~~ because there is a reported shortage or damage to notify the warehouse to resolve inventory discrepancies.

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Decision Box 416 <sup>determines what to do if</sup> ~~says this is what you do if its a damage report~~ <sup>is made</sup>.

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Referring to Figure 17, ~~on the next page,~~ decision Box 418 <sup>a damage report has been made. Damage reports are handled</sup> ~~and says this is a damage report. Damage report being~~ <sup>diffrently from</sup> different than an overage or shortage. An investigation is conducted resulting in a report which <sup>states</sup> ~~says here are the~~ circumstances concerning the freight claim.

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Decision Box 452 <sup>indicates</sup> ~~says to~~ record the damage reason in <sup>the</sup> incident database. This is done to identify if a particular product keeps getting damaged in transit. The information is recorded in this database for damage from packaging, carrier mishandling, etc. to track the damages by reason code to

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correct the situations. With carrier problems this can be transferred to their report card as part of the carrier monitoring process.

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Box 420 <sup>queries if</sup> ~~says~~ <sup>is</sup> ~~was~~ this an in-house carrier? The reason for this <sup>determination in-house carriers</sup> ~~is~~ because they are treated differently. If yes, go to decision Box 422 and the report is resolved within 48 hours. <sup>At that point</sup> ~~hours, at that point~~ it may take some investigation to

determine who was at fault. If its not resolved within 48 hours (maximum amount of time on <sup>an</sup> internal claim) <sup>the process goes</sup> ~~go~~ to decision Box 436, explained later. If resolved within 48 hours, and fault assigned, <sup>the process goes</sup> ~~go~~ to decision Box 424.

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Decision Box 426 <sup>assigns</sup> ~~assigned~~ the cost for damage to a carrier or shipper.

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Decision Box 428 <sup>determines whether</sup> ~~says~~ <sup>is</sup> the actual amount of damage over \$25.00. <sup>If so, a claim is filed with the</sup> ~~if so, file a claim with the~~ carrier in decision Box 440. There is a nine month period in the United States and three months in Canada <sup>for filing</sup> ~~to file~~ an ICC claim/form which identifies what the product was, <sup>the</sup> damage and <sup>the</sup> dollar amount.

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Decision Box 420, is basically the same decision that is made for an outside carrier that is made for an in-house carrier. If its the <sup>carrier is at fault, the process goes</sup> ~~carrier's fault,~~ go to Box 428 and <sup>a3</sup> ~~determine if its over \$25.00 and go through the decision if a~~ claim is to be filed. If its not <sup>carrier is not at</sup> ~~the carrier's fault,~~ the shipper absorbs the cost <sup>of the damage</sup>.

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Decision Box 432 is a damage report to find out why there is continuing damage. <sup>The</sup> ~~That's why the incident database~~ <sup>was</sup> ~~is~~ created. <sup>in order to generate this type of damage report</sup> ~~The right hand side is non-damaged, that is short or over.~~ <sup>products</sup> ~~First, decide is that report~~ <sup>at</sup> ~~over \$25.00.~~ <sup>as</sup> If yes, go through the regular investigation and <sup>handles</sup> ~~file~~ <sup>report accordingly</sup> the damage ~~portion.~~

Referring to fig. 18 <sup>in</sup> decision Box 442, (note previous page) the carrier has 90 days (set by ICC) to respond to a claim and acknowledge it. There is a standard acknowledgement form.

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If not in 90 days, <sup>the process goes</sup> go to decision Box 444 and <sup>where</sup> ~~file~~ a claim tracer <sup>is generated</sup> <sup>states</sup> which <sup>and inquiries why the carrier has not</sup> ~~says a claim was filed, why haven't you~~ responded. <sup>the carrier does respond</sup> If responded in 90 days, it is acknowledged. Otherwise the carrier must <sup>confirm that they received the</sup> ~~say yes, I received your~~ claim and <sup>are researching it</sup> ~~am doing further research.~~ Nothing needs to be settled in this 90 day period. <sup>A follow up on the promptness of the</sup> ~~Follow up on promptness of settlement~~ is used for carrier scorecard.

~~Decision Box 448, if resolved, then carrier is paid.~~  
<sup>In decision</sup> Decision Box 450, if carrier doesn't pay within <sup>a</sup> 60 day period, <sup>at</sup> ~~deduct loss from freight bill per agreement with~~ carrier.

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### FREIGHT PAYMENT/RECONCILIATION PROCESS

Referring to Figure 19, this is the process to pay the carrier for their freight.

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Decision Box 454 is PRISM software. <sup>The arrow down indicates that</sup> ~~Arrow down says pass~~  
an order <sup>is passed</sup> whether full or LTL to logistics. Logistics does its  
whole process and goes through load consolidation and carrier  
selection (note the rate established for the carrier). This  
rate information <sup>then</sup> is fed back into PRISM.

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Decision Box 456 provides that because the carrier is  
known there is no need to perform a reconciliation anymore.  
A carrier sends a freight bill including mileage, stop off  
charges, dividers, requiring a 100% audit of those freight  
bills back to the Bill of Lading. On the Bill of Lading is  
hand typed the actual amount of freight that is expected to be  
paid. Again, the carrier selection process lists the carrier  
and the rates they charge so when a carrier is selected and  
they've accepted the load, the system actually takes that  
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freight amount and prints it on the Bill of Lading. This  
allows the freight bill to be used <sup>is performing</sup> ~~to perform~~ a  
reconciliation, and <sup>to</sup> pay the carrier directly by going and  
approving the payment (a final check before <sup>releasing</sup> ~~you release~~ those  
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bills for payment).

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Below decision Box 456 is payment approval that may be  
going on once a week by paying carrier ABC for all the loads  
hailed <sup>in that</sup> ~~this~~ week to generate one invoice in a summary type  
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format that shows <sup>up</sup> the loads that went out <sup>that</sup> in the five day  
period. Then <sup>the</sup> "hold five days" initially for the purpose of  
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<sup>taking into account</sup> additional charges that may occur while delivering the load.

For example, the driver may be retained at a customer's dock for a specific reason, resulting in a detention charge, so the carrier may bill for that depending on the rules that are in effect for their rate. All such information is captured within that five-day period. Five days is not fixed so the system can be modified to have a separate adjustment process where the initial estimated freight charges are used based on what is shown on the carrier selection process and a separate adjustment charge made when this detention occurred resulting in an adjustment to that particular invoice/order number. For example, once a week all <sup>payments</sup> ~~payment~~ due to carrier ABC are sent from <sup>decision</sup> Box 456 <sup>indicating to</sup> ~~saying~~ make a freight payment, to S2K software in finance. The payment request would be interfaced into accounts payable. The coding is performed within the logistics process using the account numbers with <sup>an</sup> interface into accounts payable.

The line item out to the right of the hold five days area called "delivery proof/freight bill" is a request for the carrier to send proof of delivery on all freight bills on an exception basis.

#### PROOF OF DELIVERY

Referring to Figure 20, decision Box 458 indicates the carrier arriving at the customer's warehouse and <sup>unloading</sup> ~~unloads~~ which is decision Box 460. During that unloading process, the

carrier gives the warehousemen at the customer's dock a detailed list of all the products that he is delivering by SKU. The warehousemen at the customer's dock is responsible for confirming the condition and quantity of the load. At decision Box 462 it is determined if there needs to be any changes to the Bill of Lading for OS&D. The customer would actually change the Bill of Lading as part of decision Box 462.

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*The process goes*  
Go to decision box 464, and if there are any OS&D, the

carrier needs to notify the caseworker. The carrier is required while at the customer's dock to call and say if there is a problem (discussed earlier). He needs to notify the shipper again to be proactive with the customer and the shipper determines if a back order or shipment is needed, or whatever else, to satisfy that customer's needs.

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Decision box 466 <sup>indicates</sup> says that after the carrier has notified the caseworker that there are no changes to the Bill of Lading, the customer signs the Bill of Lading and this is proof of delivery. The earnings process is basically complete at this point.

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Decision box 468 <sup>indicates</sup> says for the carrier to EDI the freight bill <sup>the</sup> to shipper, or EDI the date and time of delivery to the logistics network. This will further remove paper from the system.

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a Decision Box 470 <sup>shows</sup> says that the shipper pays the freight bill by accounts payable, without <sup>the</sup> need of a paper freight bill.

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a5 Decision Box 472 <sup>queries whether the customer pays</sup> asks, ~~does the customer pay~~ the shipper or rather <sup>makes</sup> ~~does the customer make~~ any deduction on the invoice that's in addition to the agreed upon OS&D, or maybe none was <sup>is reported, the customer still may nonetheless take</sup> ~~reported and he takes~~ a deduction on the invoice anyway?

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10a Decision Box 474 <sup>shows</sup> says that shipper ~~in this case~~ requests a copy of the Bill of Lading from the carrier. <sup>when the customer does not pay the shipper</sup> Anytime there is a shortage in a receivable amount from the carrier, that's not justified or documented, a copy of the Bill of Lading is requested from the carrier. This information is used to adjust accounts receivable, if appropriate. They are required to be kept on file for six years by the ICC. This is the only time that this piece of paper is required to be delivered to the shipper. If the customer does pay the shipper the full amount, then Box 476 <sup>shows that the C.O. is closed and cash is to be</sup> ~~says close C.O. and apply cash~~ fully if <sup>applied</sup> there are no discrepancies in accounts receivable. The C.O. <sup>was</sup> ~~is~~ closed earlier in the process.

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#### IV. INVENTORY MANAGEMENT

Referring to Figure 21, there is shown a diagrammatic representation of product flow within this order management system. At the head of the diagram is shown the production area <sup>400</sup> (178) where as pallets (402) come off the receiving line

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and a bar code license plate is attached. Each pallet (402) is scanned and counted as it is loaded on the pallet train. This information is fed into the inventory management system that connects across the AS/400 network. The pallets (402) are loaded from the receiving train and the license plate and quantity are scanned in the receiving area (404). If there is an error it must be corrected before the pallet (402) is taken into the warehouse. Next each pallet (402) is stored (406) and the location is scanned. Each time a pallet (402) is moved from one location to another the pallet (402) is scanned and counted and a new location is scanned. Likewise there is hold release process (408) where a hold is put on pallets (402) and recorded in data base. Pallets (402) marked hold cannot be shipped until they are released. The pallets when pulled are moved to a shipping area (410) and if partial pallet usage is required, this information is recorded before pallets (402) are moved back to storage (406). The shipment is readied from these pallets, and is loaded and Bills of Lading issued.

20 Shown in Figure 22 is a diagram of the software function supporting the inventory process previously described.

25 Shown in Figure 23 is the hardware system that supports inventory management and control. Hand-held devices (412, 414, 416 and 418) are used in the warehouse to scan pallet license plates and to update information to the data base.

The scanned data is received by repeaters (420) and relayed to a base station (422) where through a network (422), this data is related to PCs (428, 430). Information then flows to the network server (432) which supports the inventory function and information likewise flows from this network into the reports and administration function where financial records and the like are created.

Figure 24 illustrates in diagrammatic function the normal cycle of inventory management. It shows the functions as they interrelate one to another. Particularly the production planning (434), production (436), quality assurance (438) and purchasing (440), interacting with production receiving (442) and vendor receiving (444) to create the necessary records and instructions for the <sup>putting</sup>put away (446) of inventory. Likewise the order management function (448) inputs data for workload planning (450) to assist in making a decision of which goods to use and to pick and load the goods for the carrier (454) and to close out (456) the order and report the information to the logistics functions (104) and feed back information to the order management system (<sup>448</sup>10).

Figure 25 shows the logic tree for the production and receiving function as implemented in this system and tracks through the product being received from production, palletized, inspected and then delivered to the warehouse where the product is put away and this product is entered into

inventory or quarantine with a data base created on location by SKU number, lot, quantity and reason for hold, if it is held in quarantine.

5 Figure 26 is the vendor receiving diagram showing the decision tree for the software to support this function and commences with the receipt of paperwork for items received. The information also is transmitted to logistics (104) at the same time to note the time of arrival of items received from vendors. Once again, there is an inspection function. If  
10 there is a problem, then the material is rejected and the vendor notified. If there is no problem, then the trailer is identified and unloaded and its contents tallied. Once again, if there is a problem, the buyer is notified so that they may contact the vendor. After the material is properly documented and inspected it is then delivered to the warehouse for <sup>putting</sup> put  
15 away (446) and the information on the material is inputted into the system data base for further use including the purchasing data base to support an Electronic Catalog, described later.

20 Fig. 27 is a decision tree on the put away (446) function. Put away (446) is the function of storage of items in inventory. As pallets (402) are received, identification is entered using the license plate as previously described. The pallet (402) after being identified is promptly moved to  
25 a put away (446) location which has been identified for it.

This information is fed into the data base where the system determines if the location is appropriate for it based upon factors such as the frequency of use and the size and weight of the load. Products used more frequently tend to be moved to the front of the warehouse where they can be pulled more quickly. Heavier products tend to be loaded lower in the stack than lighter products. If the location is okay, there is a count made and prompt put away (446) is accomplished. As part of the information in this inventory system are coded dates to determine if there are perishable items that need to be moved within certain dates and this is also noted in the inventory records.

Referring to fig. 28, workload planning, information on loads are received from the logistics function (102) as a basis to create receive orders (458) with estimated work effort (460) involved to provide a preplan for appointments (462). A carrier calls for appointment for delivery of goods and makes a dock appointment (464). If the carrier is unable to make appointments, this information is fed to logistics (102) where their records are updated as well.

Referring to Figure 29 there is shown the order of pick function in diagrammatic fashion. The decision tree is used to represent functions embodied in the system software to support the function. Orders are used to create a selection process based upon the license plate of a pallet (402) to

determine the goods stored on the pallet (402). This information is used to go to a picked location based upon the code dates so that perishable items are picked within their date rules first as well as the maximizing of the use of pallets by picking full pallets if that's what an order calls for, or partial pallets if not. As the process continues the driver goes to the location designated and if the product is there he picks the product and records it in a hand held device which then immediately feeds the information on location, SKU, lot and quantity back into the inventory management system through the hand held network and the driver then delivers his load to its destination in the system. A unique feature of this system is that using double-long forks, load picking can be maximized to route a driver to pick two pallets in adjacent locations, or in at least nearby locations, rather than run back and forth on a pick cycle. If the driver goes to the location and there is no product there he then puts a request back into the system to verify the request and location. If it comes back the same way, he then inputs this information into the system to create a cycle count that will then update the inventory system to show that there is an error and the product is not at the place indicated. The cycle count request will then initiate the second query into whether the inventory is available. If it's not, then there's a notification to the system that there is

a short order and this information on variances is fed back to logistics and to management functions where it can be reconciled in a new product order. If the inventory is available, then this information is fed back into the system and a new pick order is generated. Both the availability and non-availability of inventory are fed back into the system so that the system data base can be updated to respond to future pick orders.

Referring to Figure 30, shown here is a batch pick function in diagrammatic fashion. Once again a select order of goods is initiated and the location then is generated for the driver based upon code date rules and whether full pallet or partial pallet are requested. The driver goes to the location to see if the product is there. If the product is not there, as in the previous order pick function, the cycle count request is initiated to determine if there is a short order, and if the inventory is available at another location. This information is fed back into the system once again. If the product is there, there is a record made of the pull of the product by location, SKU lot and quantity. The load is then moved to the staging area from which the order is picked. A record of the pick is made and if there is a partial pallet picked, then the quantity on the pallet is updated by license plate, SKU, lot and quantity. The pallet is then delivered to the warehouse after the goods have been picked for <sup>putting</sup> ~~put~~ away.

Referring to Figure 31, there is shown an order, load and closeout function in diagrammatic fashion. Once again the diagram indicates the logic of the software implementing this function. Having previously described the functions of picking an order and the loading of the order, the description shown here is further a description of the previous function except for the gathering of documents where there is an export of the goods and appropriate Bills of Lading must be created as well as grade and quality certificates are created and signatures are obtained for the files as needed. After the order has been loaded and the updates and variances noted, the order is closed out and this information is transmitted to logistics and the order management function. Referring to Figure 32 there is shown the cycle count function in diagrammatic fashion as implemented by software in the system. The cycle count provides for correcting inventory problems that are identified in the warehouse. The inventory problems could arise from wrong location of storage of products, wrong SKU number or <sup>a</sup>lot problem. The cycle count is implemented by a visual scan that then enters the information of location SKU, lot and quantity. If this information is okay, then that data is fed back into the data base. If it's not, there is a recount initiated resulting in <sup>a</sup>further query of whether the information is okay. If it is okay it gets fed back in the system to indicate that. If not, the inventory is updated.

All of this is done without paper and is done in a real time fashion using hand-held instruments to input the data into the inventory management data base.

5 Referring to Figure 33, there is shown in diagrammatic fashion the year-end fiscal accounting of inventory. Some of the functions have been described previously and for simplicity reference is made to this diagram which is fully descriptive of the inventory count process.

10 Referring to Figure 34, the consolidation function is shown in diagrammatic fashion as implemented by software in this system. A decision is made in software as to what to do with the product received. The decisions can be to place it on a pallet, at which point in time the old pallet data from which this product was pulled is entered, including ticket and  
15 quantity and a new pallet ticket is created. If the decision is to place the material in a slot, the material is moved to a location where the pallet information and the old tag location is entered to create a new location identification. Alternatively, if the decision is to make a manual move of the  
20 product, then the old pallet data is entered as well as the new location that the pallet will be moved to, to update the records for the inventory system.

25 Referring to Figure 35, there is shown the return system and document function. As returns are received, logistics is informed of the time of arrival of the goods. Simultaneously



the truck is unloaded. The information on the material, such as quantity and the shipping information is entered into the system and the customer representative is fed this data on line before the product goes back into the inventory. There is a quality check and after making disposition on the quality, a decision is made as to whether to put the product into quarantine or back into inventory.

Referring to Figure 36, there is shown in diagrammatic fashion the outside storage decision process. When an order is received, the decision is made as to whether it's going to be used for production or needs to be stored. If the decision is for storage, the carrier is contacted and the material is moved to storage where the data on the location and the retrieval cycle is entered. There is electronic data communication with the warehouse storage to update the product/lot, code, date and number of pallets and this information is simultaneously provided to receiving to create records of the goods coming into the system and having been identified as being stored outside of the shipper's facility.

#### V. PURCHASING

Referring to Figure 37, there is shown a process of standardized purchasing. By standardizing purchases, the process of acquiring materials for the system is streamlined. This is accomplished by creating blanket vendor agreements

that have sufficient data on quantity, shipments, charges, delivery times and availability that this information can be entered into an electronic catalog (EC) for use by a user having access to the system.

5 Referring to Figure 38, there is shown in diagrammatic function the electronic catalog. The different functions of the system using the electronic catalog are noted on this diagram. The purchasing function is notable in which <sup>requests</sup> ~~request~~ for quotations are prepared based upon item usage and vendor performance. The analysis for quotes is accomplished by contract management system which provides for the monitoring of contracts vendors. <sup>A subsequent</sup> ~~Subsequent~~ vendor's performance is monitored. All of this is entered into the data base. Likewise the supplier management team, designated by SMT, examines item usage and inquiries as well as ordering patterns to determine the historical basis of future order requirements, thereby creating a decision basis as to what inventory to use to create a data base of items to be made available on the electronic catalog. The items will be standardized to the extent possible and fewer vendors approved to minimize the amount of transactions necessary for procuring repetitive standardized items. Likewise the information on receipt of goods for receiving, schedules and receipt transactions are supported by the electronic catalog.

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25 Managers may make selections from the electronic catalog using

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on-line approval procedures based upon approved budgets. This  
information is fed back into <sup>the</sup> budget and expenditure monitoring  
programs to update the financial projections for the year-end  
to determine if the budget is on target or otherwise out of  
5 performance. The electronic catalog also may be updated by  
vendors, including price updates, if there is approval for  
that practice with the vendor.

10 Referring to Figure 39, there is shown electronic catalog  
information and storage. The electronic catalog stores  
information on vendors by request for quotation, quotes  
received, whether there are contracts in place, as well as  
vendor performance and maintains an EDI profile of the vendor  
to determine how to communicate with it. The electronic  
catalog also maintains records on purchasing transactions with  
the request for items, releases of those purchase order  
15 requests, and notes the receipt of the items. Vendor catalogs  
also may be included in the electronic catalog if compatible.  
Items in the catalog are grouped by commodities, types and  
class and there is an inventory strategy as to the stocking of  
20 continually used items, if appropriate. The electronic  
catalog also notes location by company, division, department,  
user and approval hierarchy. In this fashion the goods may be  
identified at any point in time and if necessary retrieved.

25 Referring to Figure 40, there is shown in diagrammatic  
relationship, the electronic catalog (500) and how it accesses

information throughout the system. It can be seen that the electronic catalog (500) works throughout this network to update (120) accounts payable as well as to show when there has been a payment to or by a vendor. The electronic catalog  
5 (500) also interacts with the human resources input system (502) to identify approved users in the system. The electronic catalog (500) also interacts with the transportation, maintenance technique inventory system (504) to identify items for the fleet maintenance system. The  
10 electronic catalog (500) also interacts with the ELKE maintenance system (506), and the MRO inventory (508), which is a store room inventory system, to see if items are in stock and to respond to a request by a user, versus having to order the items from the catalog. The EC also interacts with the  
15 PRISM software (170) to update inventory records. As previously stated, the electronic catalog (500) interacts with the vendor (510) to receive quotes and to ask the vendor (510) for requests for quotations and transmit contracts back and forth. This communication is by EDI, supplemented by fax,  
20 phone and release orders, if appropriate. The electronic catalog notes receipts of goods (512), so its data base may be updated.

Modifications and variations of the above-described embodiments of the present invention are possible, as

appreciated by those skilled in the art in light of the above teachings.

It is therefore to be understood that, within the scope of the appended claims and their equivalents, the invention  
5 may be practiced otherwise than as specifically described.

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